

EXHIBIT N

First Supplemental EXHIBIT A-Obviousness

Invalidity of U.S. Patent No. 7,924,802 (“’802 Patent”) Obviousness Chart

1. Claim 1

Claim Language		Prior Art Reference Disclosure
[1.1]	A method of transmitting information in a wireless communication channel comprising:	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p>

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[1.2]	<p>transmitting first information across a first frequency range using a wireless transmitter, the first frequency range having a first center frequency, a first highest frequency, and a first lowest frequency; and</p> <p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p>

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[1.3]	simultaneously transmitting second information across a second frequency range using the same wireless transmitter, the second frequency range having a second center	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p>

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	<p>frequency greater than the first center frequency, a second highest frequency, and a second lowest frequency.</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p>

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	<p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p>

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2. Claim 2

Claim Language		Prior Art Reference Disclosure
2	The method of claim 1 wherein frequency difference between the first center frequency and the second center frequency is greater than the sum of one-half the first frequency range and one-half the second frequency range.	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p>

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	<p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p>

Claim Language	Prior Art Reference Disclosure
	<p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p>

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3. Claim 3

Claim Language		Prior Art Reference Disclosure
3	The method of claim 1 wherein the first and second information are transmitted using the same power amplifier in said wireless transmitter.	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p>

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4. Claim 4

Claim Language		Prior Art Reference Disclosure
4	The method of claim 3 wherein the bandwidth of said power amplifier is greater than the difference between the first lowest frequency and the second highest frequency.	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p>

Claim Language	Prior Art Reference Disclosure
	<p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deerga Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p>

Claim Language	Prior Art Reference Disclosure
	<p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>

5. Claim 6

Claim Language	Prior Art Reference Disclosure
<p>6</p> <p>The method of claim 1 wherein the first information corresponds to a first wireless protocol and the second information corresponds to a second wireless protocol.</p>	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p>

Claim Language	Prior Art Reference Disclosure
	<p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT'L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deerga Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>

6. Claim 7

Claim Language	Prior Art Reference Disclosure
7	<p>The method of claim 1 wherein the first information and the second information are the same data transmitted across two different frequencies.</p> <p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p>

Claim Language	Prior Art Reference Disclosure
	<p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT'L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>

7. Claim 8

Claim Language	Prior Art Reference Disclosure
8	<p>The method of claim 1 wherein the first information and the second information are from the same data stream.</p> <p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p>

Claim Language		Prior Art Reference Disclosure
		<p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>

8. Claim 9

Claim Language		Prior Art Reference Disclosure
9	The method of claim 1 wherein first information and second information comprise a plurality of OFDM symbols, wherein	Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1

Claim Language	Prior Art Reference Disclosure
<p>a first symbol is transmitted during a first time slot across the first frequency range and a second symbol is transmitted during the first time slot across the second frequency range, and wherein a third symbol is transmitted during a second time slot across the first frequency range and a fourth symbol is transmitted during the second time slot across a second frequency range.</p>	<p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p>

Claim Language		Prior Art Reference Disclosure
		<p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deerga Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>

9. Claim 10

Claim Language		Prior Art Reference Disclosure
10.1	A method of transmitting information in a wireless communication channel comprising:	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p>

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	<p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p>

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	<p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deerga Rao (“Rao”) <i>See</i> Exhibit A-22</p>

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		<p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>
10.2	receiving a first digital signal comprising first data to be transmitted;	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p>

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		<p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>
10.3	receiving a second digital signal comprising second data to be transmitted;	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p>

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	<p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p>

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	<p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\text{Log}_2(1+\text{SNR})$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p>

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	IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31
10.4	<p>converting the first digital signal into a first analog signal using a first digital-to-analog converter, the first analog signal carrying the first data across a first frequency range;.</p> <p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p>

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10.5	converting the second digital signal into a second analog signal using a second digital-to-analog converter, the second analog signal	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p>

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<p>carrying the second data across a second frequency range;</p>	<p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p>

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10.6	up-converting the first analog signal to a first RF center frequency to produce a first up-converted analog signal, wherein the first up-converted analog signal comprises a first up-converted frequency range from the first RF center frequency minus one-half the first frequency range to the first RF center frequency	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p>

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plus one-half the first frequency range;	<p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p>

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10.7	up-converting the second analog signal to a second RF center frequency greater than the first center RF frequency to produce a second up-converted analog signal, wherein the second up-converted analog signal comprises a second up-converted frequency range from the second RF center frequency minus one-half the second frequency range to the second RF center frequency plus one-half the second frequency range, and wherein a frequency difference between the first RF center frequency and the second RF center	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p>

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<p>frequency is greater than the sum of one-half the first frequency range and one-half the second frequency range;</p>	<p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p>

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		IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31
10.8	combining the first up-converted analog signal and the second up-converted analog signal to produce a combined up-converted signal;	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p>

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	<p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p>

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10.9	amplifying the combined up-converted signal in a power amplifier resulting in an amplified combined up-converted signal; and	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p>

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10.10	transmitting the amplified combined up-converted signal on a first antenna,	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p>

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		<p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>
10.11	wherein the bandwidth of said power amplifier is greater than the difference between a lowest frequency in the first up-converted frequency range and a highest frequency in the second up-converted frequency range.	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p>

Claim Language	Prior Art Reference Disclosure
	<p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p>

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	<p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p>

Claim Language		Prior Art Reference Disclosure
		IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31

10. Claim 13

Claim Language		Prior Art Reference Disclosure
13	The method of claim 10 wherein the first digital signal is encoded using a first wireless protocol and the second digital signal is encoded using a second wireless protocol.	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p>

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	<p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p>

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11. Claim 14

Claim Language		Prior Art Reference Disclosure
14.1	The method of claim 10	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p>

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	<p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p>

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14.2	<p>wherein the second data is the same as the first data, the method further comprising:</p> <p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p>

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14.3	receiving the transmitted signal on a second antenna;	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p>

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	<p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p>

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	<p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+\text{SNR})$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deerga Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p>

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		<p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>
14.4	amplifying the received signal in a low noise amplifier resulting in an amplified received up-converted signal, wherein the bandwidth of said low noise amplifier is greater than the difference between the lowest frequency in the first up-converted frequency range and the highest frequency in the second up-converted frequency range;	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p>

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	<p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p>

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	<p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\text{Log}_2(1+\text{SNR})$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p>

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		IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31
14.5	down-converting the amplified received up-converted signal using a first down-converter and a signal corresponding to the first RF center frequency to produce a fourth analog signal corresponding to the first analog signal; and	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p>

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	<p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p>

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		<p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT'L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>
14.6	down-converting the amplified received up-converted analog signal using a second down-converter and a signal corresponding to the	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p>

Claim Language	Prior Art Reference Disclosure
<p>second RF center frequency to produce a fifth analog signal corresponding to the second analog signal.</p>	<p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p>

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		<p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>

12. Claim 17

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17.1	A wireless communication system comprising:	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p>

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	<p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p>

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		<p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>
17.2	a baseband digital system for providing a first digital signal comprising a first data to be transmitted and a second digital signal comprising a second data to be transmitted;	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p>

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	<p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al.(“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p>

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	<p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deerga Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p>

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		<p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>
17.3	a first digital-to-analog converter for receiving the first digital signal and converting the first digital signal into a first analog signal, the first analog signal carrying the first data across a first frequency range;	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p>

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	<p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT'L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>
17.4	<p>a second digital-to-analog converter for receiving the second digital signal and converting the second digital signal into a</p> <p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p>

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<p>second analog signal, the second analog signal carrying the second data across a second frequency range;</p>	<p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p>

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17.5	a first up-converter circuit having a first input coupled to receive the first analog signal and a second input coupled to receive a first modulation signal having a first RF frequency, wherein the first up-converter outputs a first up-converted analog signal comprising a first up-converted frequency range from the first RF frequency minus one-half the first	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p>

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<p>frequency range to the first RF frequency plus one-half the first frequency range;</p>	<p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p>

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17.6	a second up-converter circuit having a first input coupled to receive the second analog signal and a second input coupled to receive a second modulation signal having a second RF frequency, wherein the second up-converter outputs a second up-converted analog signal comprising a second up-converted frequency range from the second RF frequency minus one-half the second frequency range to the second RF frequency plus one-half the second frequency range, and wherein frequency difference between the first RF	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p>

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<p>frequency and the second RF frequency is greater than the sum of one-half the first frequency range and one-half the second frequency range; and</p>	<p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p>

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Claim Language	Prior Art Reference Disclosure
	IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31
17.7	<p>a power amplifier coupled to receive the first and second up-converted analog signals, wherein the bandwidth of the power amplifier is greater than the difference between a lowest frequency in the first up-converted frequency range and a highest frequency in the second up-converted frequency range.</p> <p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p>

Claim Language	Prior Art Reference Disclosure
	<p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT'L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>

13. Claim 21

Claim Language	Prior Art Reference Disclosure
21	<p>The communication system of claim 1 wherein the first data of the first digital signal is encoded using a first wireless protocol and the first data of the second digital signal is encoded using a second wireless protocol.</p> <p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p>

Claim Language		Prior Art Reference Disclosure
		<p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>

14. Claim 22

Claim Language		Prior Art Reference Disclosure
22	The communication system of claim 1 wherein the second data corresponds to the first data and wherein the	Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1

Claim Language	Prior Art Reference Disclosure
<p>power amplifier outputs a third up-converted signal comprising the up-converted first analog signal and the up-converted second analog signal.</p>	<p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p>

Claim Language		Prior Art Reference Disclosure
		<p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deerga Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>

15. Claim 23

Claim Language		Prior Art Reference Disclosure
23	The communication system of claim 17 wherein first and second data to be transmitted comprise a plurality of OFDM symbols, wherein a first symbol is transmitted during a first time slot across the first	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p>

Claim Language	Prior Art Reference Disclosure
<p>up-converted frequency range and a second symbol is transmitted during the first time slot across the second up-converted frequency range, and wherein a third symbol is transmitted during a second time slot across the first up-converted frequency range and a fourth symbol is transmitted during the second time slot across a second up-converted frequency range.</p>	<p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montojo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p>

Claim Language	Prior Art Reference Disclosure
	<p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deerga Rao (“Rao”) <i>See</i> Exhibit A-22</p>

Claim Language		Prior Art Reference Disclosure
		<p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>

16. Claim 24

Claim Language		Prior Art Reference Disclosure
24.1	An electronic circuit comprising:	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p>

Claim Language	Prior Art Reference Disclosure
	<p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p> <p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deerga Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p>

Claim Language	Prior Art Reference Disclosure
	<p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>
24.2	<p>a first down-converter circuit having a first input coupled to receive a first up-converted signal, a second input coupled to receive a first demodulation signal having a first RF frequency, and an output, wherein the first down-converter circuit outputs a first down-converted signal on the first down-converter output;</p> <p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p>

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	<p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al.(“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p> <p><i>Effects of Nonlinear Distortion on Switched Multibeam FDMA Systems</i>, IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION, Volume 51, No. 3 by Mattias Wennström et al. (“Wennström”) <i>See</i> Exhibit A-18</p> <p>Nokia and Ericsson base station equipment and UEs capable of implementing carrier aggregation technologies for transmitting uplink and/or downlink information over wireless channels, including dual-cell high speed packet access <i>See</i> Exhibit A-19</p> <p>U.S. Patent Application Publication No. 2006/0281487 (“Girardeau”)</p> <p>U.S. Patent Application Publication No. 2007/0004350 (“Yoon”)</p> <p>U.S. Patent Application Publication No. 2007/0004351 (“Dekker”)</p>

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	<p>JP Patent Publication No. 2007258904A (“Nakayama-JP”)</p> <p>U.S. Patent No. 7,145,934 (“Liang”)</p> <p>T. Cornish, <i>Single-Aperture Multiple-Carrier Uplink Using a 20 Kilowatt X-Band Transmitter</i>, TMO PROGRESS REPORT</p> <p>Max Martone, <i>Space-time Open Architectures for Broadband Wireless Data Communications: Above the $\log_2(1+SNR)$ Bit/Sec.Hz Barrier</i>, GLOBECOM</p> <p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT’L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deerga Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p>

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24.3	<p>a second down-converter circuit having a first input coupled to receive the first up-converted signal, a second input coupled to receive a second demodulation signal having a second RF frequency different than the first RF frequency, and an output, wherein the second down-converter outputs a second down-converted signal on the second down-converter output, wherein the first up-converted signal comprises a first signal modulated at the first RF frequency and a second signal modulated at the second RF frequency; and</p>	<p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p> <p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p>

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	<p>Zhou Qi et al., <i>Digital Multi-channel Combination in Transmitter Design</i>, 2004 4TH INT'L CONF. ON MICROWAVE AND MILLIMETER WAVE TECH. PROCEEDINGS</p> <p>U.S. Patent No. 7,742,388 (“Shearer”) <i>See</i> Exhibit A-20</p> <p>U.S. Patent No. 6,516,206 (“Jäntti”) <i>See</i> Exhibit A-21</p> <p><i>Analysis of Effects of Clipping and Filtering on the Performance of MB-OFDM UWB Signals</i> by K. Deergha Rao (“Rao”) <i>See</i> Exhibit A-22</p> <p>U.S. Patent Application Publication No. 2007/0081613 (“Kim-613”) <i>See</i> Exhibit A-23</p> <p>U.S. Patent Application Publication No. 2005/0237923 (“Balakrishnan”) <i>See</i> Exhibit A-24</p> <p>U.S. Patent No. 8,416,879 (“Rofougaran”) <i>See</i> Exhibit A-25</p> <p>U.S. Patent Application Publication No. 2010/0062726 (“Zheng”) <i>See</i> Exhibit A-26</p> <p>U.S. Patent No. 8,693,525 (“Rick”) <i>See</i> Exhibit A-27</p> <p>U.S. Patent No. 6,952,454 (“Jalali”) <i>See</i> Exhibit A-28</p> <p>U.S. Patent No. 6,359,868 (“Chen-868”) <i>See</i> Exhibit A-29</p> <p>IEEE 802.11n Draft 2.0 (“802.11n D2.0”) <i>See</i> Exhibit A-30</p> <p>IEEE Standard 802.11-2007 (“802.11-2007”) <i>See</i> Exhibit A-31</p>
24.4	<p>a filter having an input coupled to the output of the first down-converter and the output of the second down-converter, and in accordance</p> <p>Channel Estimation for Long Distance HF Communications based on OFDM Pilot Symbols, COMMUNICATIONS AND SIGNAL THEORY, by R. Aquilué et al. (“Aquilué”) <i>See</i> Exhibit A-1</p> <p>U.S. Patent No. 7,162,218 (“Axness-218”) <i>See</i> Exhibit A-2</p>

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<p>therewith, the filter receives the first and second down-converted signals.</p>	<p>U.S. Patent Application Publication No. 2006/0212773 (“Aytur”) <i>See</i> Exhibit A-3</p> <p>U.S. Patent Application Publication No. 2005/0249266 (“Brown-266”) <i>See</i> Exhibit A-4</p> <p>U.S. Patent No. 8,036,702 (“Etemad”) <i>See</i> Exhibit A-5</p> <p>U.S. Patent Application Publication No. 2009/0052556 (“Fernandez”) <i>See</i> Exhibit A-6</p> <p><i>Equipment for On-Board Processing Payloads – Developments in the Frame of the ESA OBP Program</i>, 2000 AMERICAN INSTITUTE OF AERONAUTICS & ASTRONAUTICS by G. Garofalo et al. (“Garofalo”) <i>See</i> Exhibit A-7</p> <p>U.S. Patent No. 6,876,645 (“Guey”) <i>See</i> Exhibit A-8</p> <p>U.S. Patent No. 6,920,185 (“Hinson”) <i>See</i> Exhibit A-9</p> <p><i>Linearization of Multi-Carrier Power Amplifiers</i>, IEEE, by Mats Johansson et al. (“Johansson”) <i>See</i> Exhibit A-10</p> <p>U.S. Patent Application Publication No. 2006/0233147 (“Karabinis”) <i>See</i> Exhibit A-11</p> <p>U.S. Patent No. 6,529,715 (“Kitko”) <i>See</i> Exhibit A-12</p> <p>WIPO Patent Application Publication No. 2005/109917 (“Laroia”) <i>See</i> Exhibit A-13</p> <p>U.S. Patent No. 8,204,452 (“Lin”) <i>See</i> Exhibit A-14</p> <p>U.S. Patent Application Publication No. 2005/0135312 (“Montejo”) <i>See</i> Exhibit A-15</p> <p>U.S. Patent No. 7,885,344 (“Nakayama”) <i>See</i> Exhibit A-16</p> <p>U.S. Patent Application Publication No. 2006/0276146 (“Suzuki”) <i>See</i> Exhibit A-17</p>

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